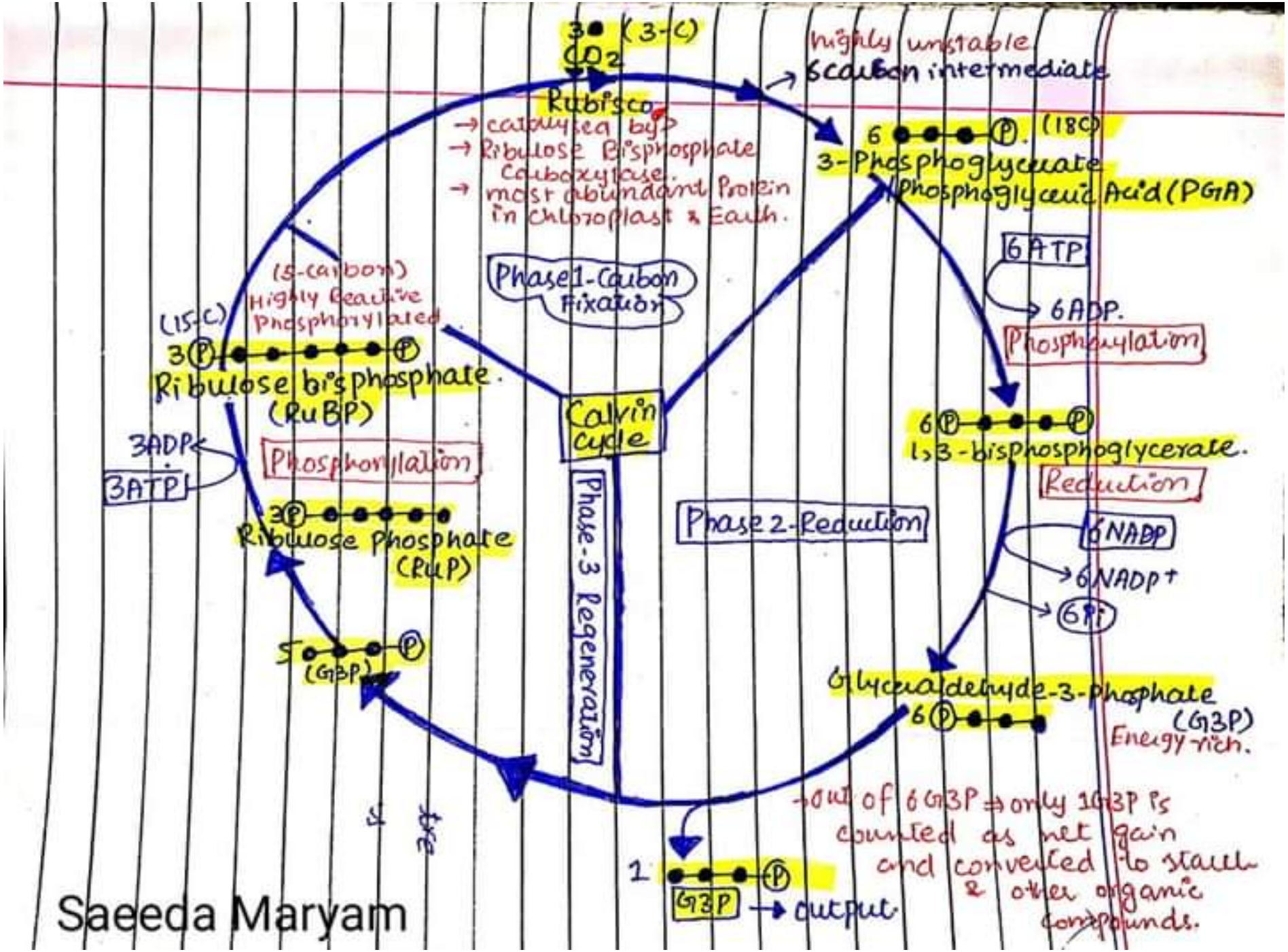

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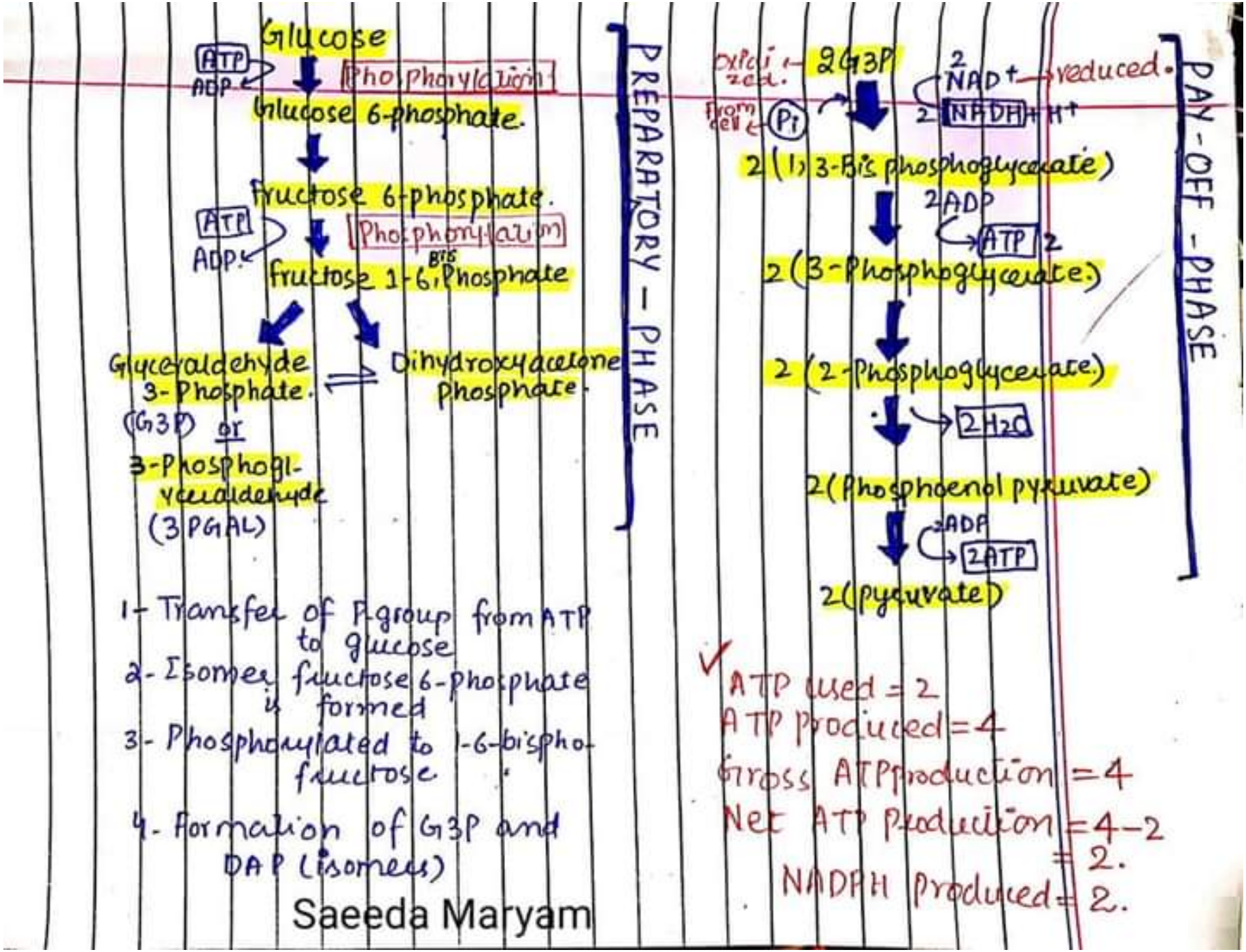
Glucose
ATP
ADP
Phosphorylation
Glucose 6-phosphate.
Fructose 6-phosphate.
ATP
ADP
Phosphorylation
Fructose 1-6 Bis Phosphate
Glyceraldehyde 3-Phosphate. (G3P) or 3-Phosphoglyceraldehyde (3PGAL)
Dihydroxyacetone phosphate.
PREPARATORY - PHASE
1- Transfer of P-group from ATP to glucose
2- Isomer fructose 6-phosphate is formed
3- Phosphorylated to 1-6-bisphosphofructose
4- Formation of G3P and DAP (isomers)
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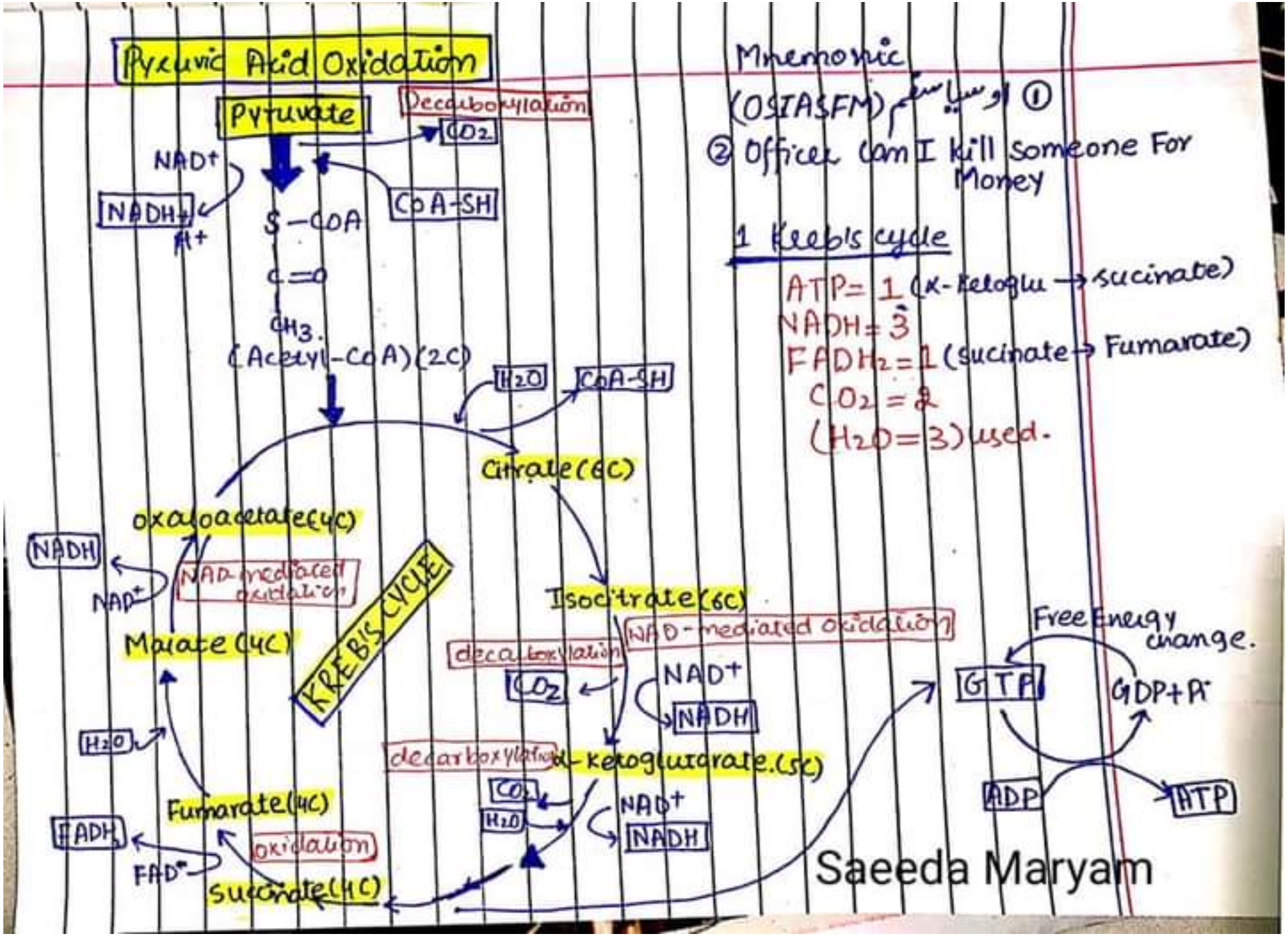
oxidized.
2G3P
2 NAD+ → reduced.
From cell
Pi
2 NADH + H+
2 (1,3-Bisphosphoglycerate)
2ADP
ATP 2
2 (3-Phosphoglycerate)
2 (2-Phosphoglycerate)
2H2O
2 (Phosphoenol pyruvate)
2ADP
2ATP
2 (pyruvate)
PAY-OFF-PHASE
ATP used = 2
ATP produced = 4
Gross ATP production = 4
Net ATP Production = 4-2 = 2.
NADPH produced = 2.


Pyruvic Acid Oxidation
Pyruvate
Decarboxylation
CO2
NAD+
NADH+H+
CoA-SH
S-CoA
C=O
CH3.
(Acetyl-CoA)(2C)
H2O
CoA-SH
Citrate(6C)
oxaloacetate(4C)
NADH
NAD+
NAD-mediated oxidation
Malate(4C)
KREBS CYCLE
Isocitrate(6C)
NAD-mediated oxidation
decarboxylation
CO2
NAD+
NADH
decarboxylation
α-ketoglutarate.(5C)
CO2
H2O
NAD+
NADH
H2O
Fumarate(4C)
FADH2
FAD+
oxidation
Succinate(4C)
Free Energy change.
GTP
GDP+Pi
ADP
ATP
Mnemonic
(OSIASFM) او سیاسفم ①
② Officer Can I Kill Someone For Money
1 Krebs cycle
ATP= 1 (α-Keloglu → sucinate)
NADH= 3
FADH2=1 (sucinate → Fumarate)
CO2 = 2
(H2O=3) used.
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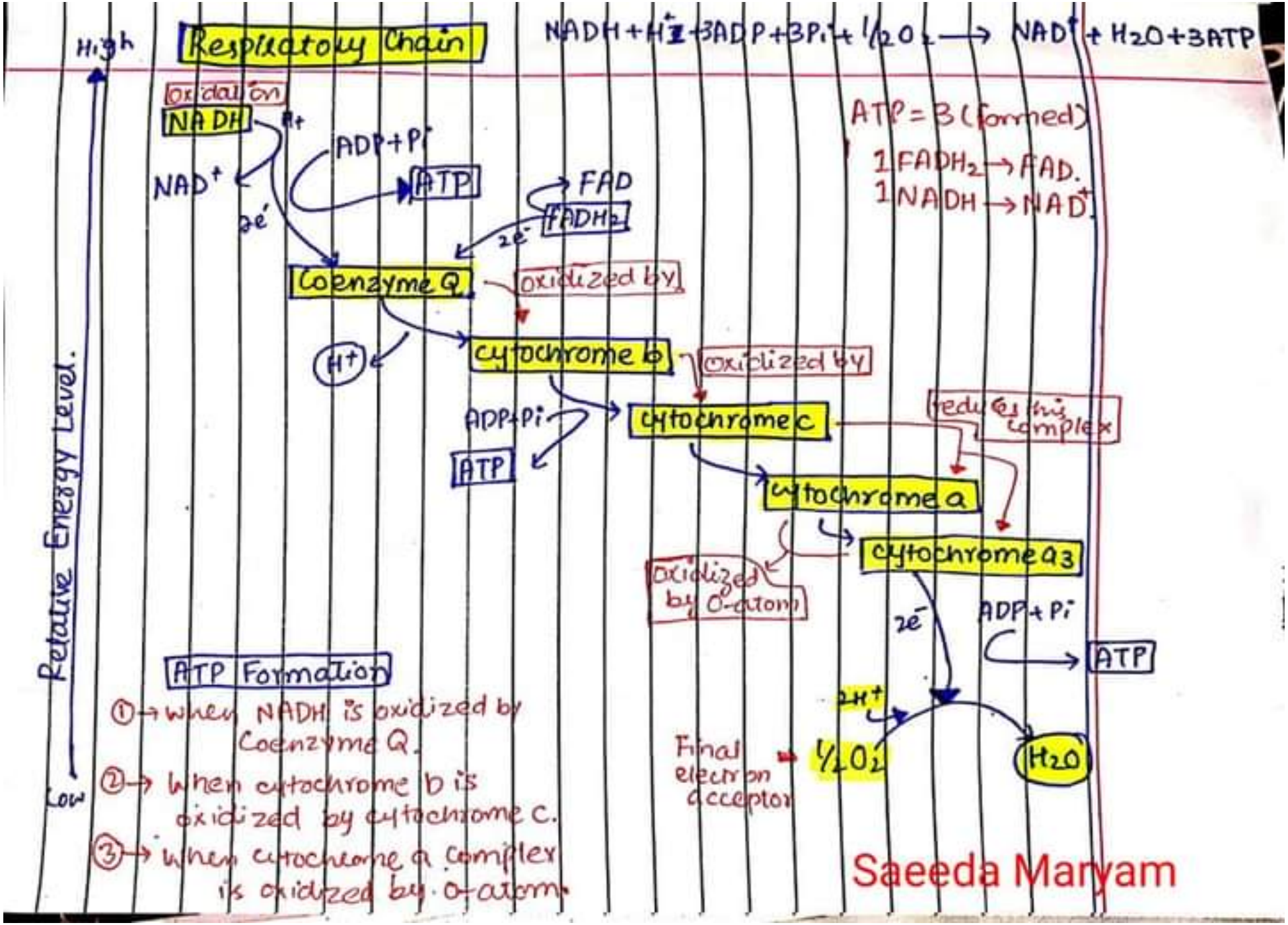
Respiratory Chain
NADH + H+ + 3ADP + 3Pi + 1/2 O2 → NAD+ + H2O + 3ATP
High
Low
Relative Energy Level.
Oxidation
NADH
H+
NAD+
2e-
ADP+Pi
ATP
FAD
FADH2
2e-
Coenzyme Q
oxidized by
H+
cytochrome b
oxidized by
ADP+Pi
ATP
cytochrome c
reduced by this complex
cytochrome a
cytochrome a3
oxidized by O-atom
2e-
ADP+Pi
ATP
2H+
Final electron acceptor
1/2 O2
H2O
ATP = 3 (formed)
1 FADH2 → FAD.
1 NADH → NAD+
ATP Formation
① → when NADH is oxidized by Coenzyme Q.
② → when cytochrome b is oxidized by cytochrome c.
③ → when cytochrome a complex is oxidized by O-atom.
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Calculations

Steps.	ATP	NADH	$FADH_2$	CO_2.
Glycolysis x 1	4 ATP	2 NADH	-	-
Pyruvate oxidation x 2	-	2 NADH	-	$2CO_2$.
Krebs cycle x 2.	2 ATP	6 NADH	$2FADH_2$	$4CO_2$.
Total	6	10	2	

1 NADH = 3 ATP
1 $FADH_2$ = 2 ATP

= 6 ATP + 10 x 3 ATP + 2 x 2 ATP

= 6 + 30 + 4

Total ATP Produced = 40

Net ATP

In eukaryotes. { 2 used in glycolysis
2 used in pumping NADH.

Net ATP = 36.

In Prokaryotes: → 2 used in glycolysis.

Net ATP = 38

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